



DIL Engineering Task Group

Costs of Returned Concrete

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Why are we discussing returned concrete?

Returned Concrete

• 2%-10% of Production (avg 6%)

Industry

» 385,000,000 yd³ annually

Plant

» 53,000 yd³ annually

Truck

» 5,300 yd³ annually

- Growing problem - % returned is constant but increasing concrete volume produced
- Has a direct impact on companies' revenue/profits
 - More operational efficiency to offset driver shortage and increasing material cost
- Push for carbon neutrality - Increased interest for producers to understand impact on full process
 - Increasing regulations and environmental constraints
- Lack of comprehensive tools available to quantify cost and footprint for handling returned concrete

NRMCA COPQ Form Section 8

As you can see, the tool analyzes the cost on two aspects: Material Cost and Handling Cost without going into more details:

#8 - Rejected Concrete Cost

What's This?

Rejected Yards	<input type="text"/>				
<input type="text" value="Material Cost"/>	<table border="1"><thead><tr><th>Avg. Cost/Unit</th><th>Unit</th></tr></thead><tbody><tr><td><input type="text"/></td><td><input type="text"/></td></tr></tbody></table>	Avg. Cost/Unit	Unit	<input type="text"/>	<input type="text"/>
Avg. Cost/Unit	Unit				
<input type="text"/>	<input type="text"/>				
<input type="text" value="Handling Cost"/>	<input type="text"/>				
<input type="text" value="Total"/>	<input type="text" value="\$0.00"/>				
# Saved Yards =	<input type="text"/>				
Discounted Cost/yd	<input type="text"/>				
Percent Rejected =	<input type="text" value="0.00%"/>				
Rejected Cost Per Yd3 =	<input type="text" value="\$0.00"/>				
Total Annual Cost =	<input type="text" value="\$0.00"/>				

Start | 1. Fill | **COPQ FORM** | #1 | #2 | #3 | #4 | #5 | #6

Does not consider all the different options to handle returned concrete.

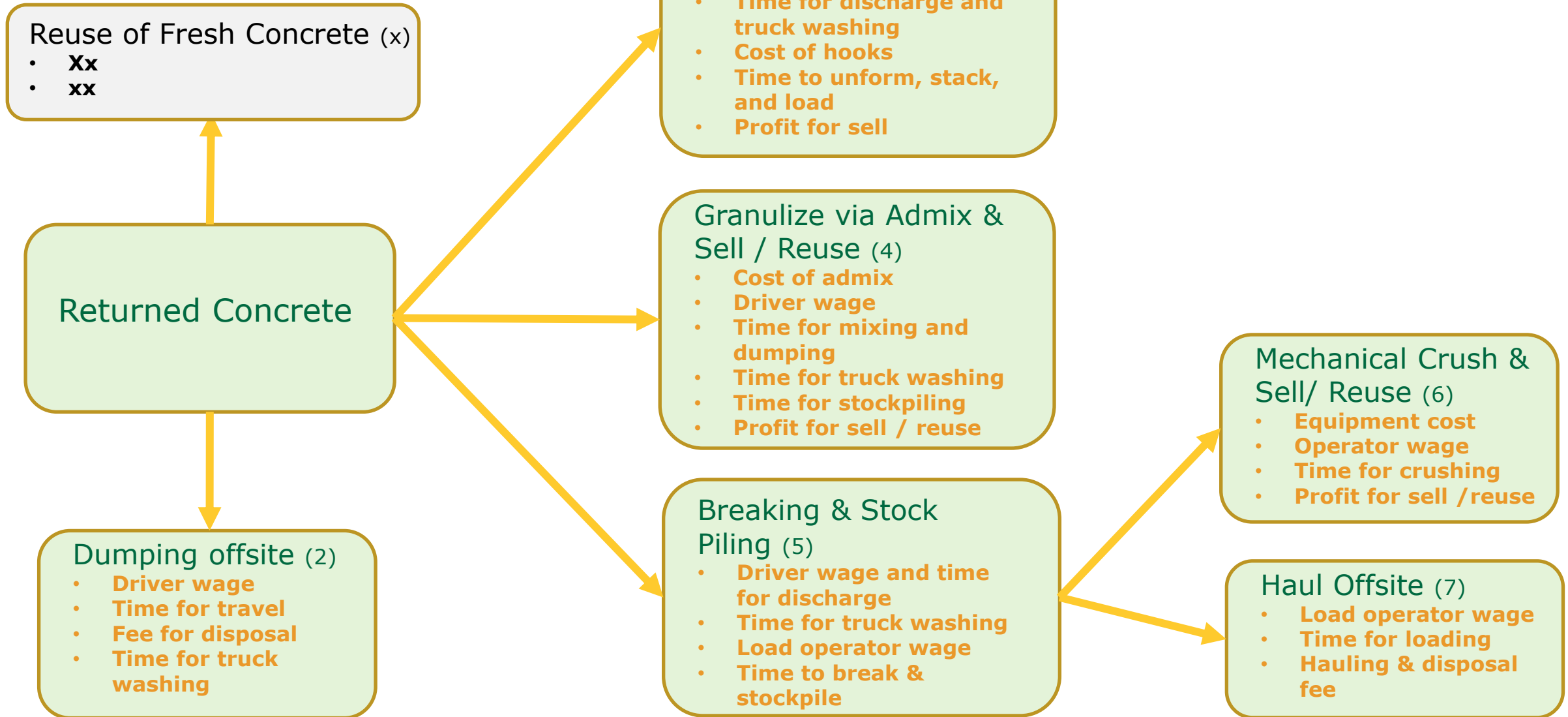
- Send directly to a disposal facility
- Produce blocks and sell
- Granulize via admix or mechanical crush and sell or reuse
- Reuse fresh concrete and batch on top
- Etc.

Engineering Task Group Objectives

- The primary objective of the task group was to:
 - ❑ Evaluate the processes a concrete producer has available to address returned concrete
 - ❑ Accurately quantify profit/loss for a given handling process
 - ❑ Create a user-friendly electronic tool for producers to identify optimum management of returned concrete



Process Options



General Information

1. General information

What is the truck and driver hourly wage? \$/hour

What is the loader operators' wage? \$/hour

How much time driver takes to wash his truck after dumping? mins/truck

What is your average load size of returned concrete? yd³

What is your yard equipment variable cost per hour? \$/hr.

Dumping Offsite

Returned Concrete



Dumping offsite (2)

- Driver wage
- Time for travel
- Fee for disposal
- Time for truck washing

2. Dumping Offsite

How much time driver takes to dump? mins/yd³

What is the travel time to the site where concrete is dumped? mins/round trip

If you pay per tonnage to dispose the concrete offsite, what is your rate? \$/ton

If you pay per number of trucks to dispose the concrete offsite, what is your rate? \$/truck

If you pay a monthly fee to dispose the concrete offsite, what is your fee? \$/month

If you are paid for the returned concrete dumping, what is your rate? \$/ton

Block Production

Returned Concrete

Produce Blocks & Sell (3)

- Capacity of forms
- Driver wage and time
- Time for discharge and truck washing
- Cost of hooks
- Time to unform, stack, and load
- Profit for sell

3. Block Production

What is your selling price? \$ /block

What is the capacity of your forms? yd^3 /form

What is the cost for the hooks used? \$/block

How much time drivers take to fill the forms? mins/form

How much time it takes to strip forms & stack the blocks? mins/form

How much time it takes to stack the blocks? mins/block

How much time it takes to load the hauler? mins/block

Granulize via Admix

Granulize via Admix & Sell / Reuse (4)

- **Cost of admix**
- **Driver wage**
- **Time for mixing, dumping, washing**
- **Time for stockpiling**
- **Profit for sell / reuse**

Returned Concrete

4. Granulize via admix

What is the cost of the admix? \$/yd³

How much time it takes to add the admix, mix and dump? mins/yd³

How much of this material is your loader operator able to stockpile per hour? ton/hr.

If you reuse the granulized material, what is your cost of virgin aggregate? \$/ton

If you sell the material, what is your selling price? \$/ton

Break & Stockpile

Returned Concrete

Breaking & Stock Piling (5)

- Driver wage and time for discharge
- Time for truck washing
- Load operator wage
- Time to break & stockpile

5. Dumping onsite, breaking, and stockpiling

How much time does the driver take to dump the returned concrete? mins/yd³

How many tons per hour is your loader operator able to break? ton/hr.

How many tons per hour is your loader operator able to stockpile? ton/hr.

Granulize Via Mechanical Crusher

Returned Concrete

- Breaking & Stock Piling (5)
- Driver wage and time for discharge
 - Time for truck washing
 - Load operator wage
 - Time to break & stockpile

- Mechanical Crush & Sell/ Reuse (6)
- Equipment cost
 - Operator wage
 - Time for crushing
 - Profit for sell /reuse

6. Granulize via mechanical crusher

If you rent a crusher, what is the total rental fee per hour? \$/hour

If you rent a crusher, what is its capacity? tonnes/hr

If you have a crusher onsite, how many tonnes is your loader operator able fill the equipment's' hopper per hour? tonnes/hr

If you have a crusher onsite, what is the equipment operators' wage? \$/hour

If you have a crusher onsite, what is your crushers' variable cost per hour? \$/hr

If you reuse the granulized material, what is your cost of virgin aggregate? \$/ton

If you resell the material, what is your selling price? \$/ton

** fee should include, equipment, labour to run crusher and loader and both equipments variable cost*

Haul Offsite

Returned Concrete

- Breaking & Stock Piling (5)
- Driver wage and time for discharge
 - Time for truck washing
 - Load operator wage
 - Time to break & stockpile

- Haul Offsite (7)
- Load operator wage
 - Time for loading
 - Hauling & disposal fee

7. Haul offsite

If you pay to haul the returned concrete per load, what is the price? \$/load

How much time does the loader operator take to load the hauler? mins/truck

What is the average tons per truck hauled? ton/truck

If you pay to haul concrete by weight, how much do you pay per ton? \$/ton

If you resell the material, what is your selling price? \$/ton

Cost of Returned Concrete Tool Demonstration



Cost of Returned
Concrete



Next Steps

- Receive feedback from Industry
- Add other processes and input fields
- Finalize tool